Attachment 9.1 – Supporting Documents

Program Preferences

Madera Region – IRWM Implementation Grant Application

Table of Contents

Program Preferences 3

Regional Projects and Programs 5

Integrating Water Management with Land Use Planning 10

Statewide Priorities

Drought Preparedness 10

Efficient Use of Water 11

Expand Environmental Stewardship 11

Integrated Flood Management 12

Protect Surface and Groundwater Quality 12

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Attachment 9.1, Program Preferences

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The proposed programs, individually and collectively, meet the following program preferences:

1. Regional Projects and Programs - Three of the major goals of the Madera IRWMP are to mitigate flood hazards, manage groundwater so as to maximize beneficial water use and reduce the groundwater overdraft, and to protect groundwater quality. The proposed projects will help to meet these goals on a regional basis as follows.

I. Flood Hazard Reduction - The Brockman Flood Control Basin will provide a retention storage facility divert peak storm water flow from the Madera Ranchos South drainage. The current 100-year peak flow according to the FEMA flood study of the area is 520 cfs. The storage provided by the Project will reduce peak flow in a 100-year even to 140 cfs. (See Attachment 7.1, Project D, Brockman Flood Control Basin Technical Justification, Benefit 1, on page 16.) This 73% reduction in flow greatly reduces the width and area of the of the 100-year SFHA downstream of the Project basin. Potential flood damage due to a 100-year flood event would be reduced from $5.2 million to zero. (See Attachment 8.1D, Brockman Table 17.)

Flood damage from storms with return frequencies less than 100 years would also be completely eliminated by the water storage made available by the Project. Though the Project would not be large enough to fully mitigate the damage caused by a 500-year event, predicted damage would be reduced from $6.05 million to $1.37 million, a reduction of 77%. (See Brockman Table 17.)

II. Groundwater management to maximize beneficial use and reduce overdraft – Projects B, C, D, E and F each work to manage groundwater and reduce overdraft.

Project B, MD 19 Parkwood Water Supply and Water Meters, will reduce groundwater pumping by reducing domestic water use through the installation of water meters in a 605-unit DAC. The current annual water use averages 383,378 gpd. January water production averages 7 million gallons, while summer water projection (June, July, August) typically ranges from 17 million to 20 million gallons.

The large difference between summer and winter use is all assignable to outdoor irrigation. Similar systems have experienced 20% to 25% drops in annual water use through installation of water meters and imposition of progressive, revenue-neutral water rates. Parkwood can expect similar results.

With meters installed, a savings of 20 percent would result in a reduction in water production per average day of about 76,675 gpd, which sums to 27,986,375 gallons or 86 acre-feet per yea, all of which is water left in the aquifer and directly reducing groundwater overdraft.

Project C, MD 8 North Fork/ South Fork Sewer System Improvements, will make conjunctive use of recycled wastewater for irrigation use. In North Fork, additional treated effluent will be discharged via expanded spray fields. The treated effluent will be disposed by percolation, evaporation, and evapo-transpiration. Excess flows will be recaptured by the effluent return ditches and pumped back to be re-circulated. The treated flows that are percolated directly enhance the groundwater recharge in the North Fork area. The expected quantity increase is 15,875 gallons per day. (See Attachment 7.1C, Table 9b.)

Project D, Brockman Flood Control Basin, will add capacity to recharge diverted flood water to benefit the groundwater basin. The basin will be available outside of peak rainfall months to recharge imported surface water in addition to its primary flood control purpose. All water will be recharged in southeast Madera County, in an area where groundwater surface decline has averaged nearly five feet per year for over 20 years.

The actual long-term permeability of the Project basin has been estimated from geotechnical studies done in the local area for projects with similar soils profiles, including the Rampage Vineyards located immediately east of the Project site. To calculate Project outcomes, a percolation rate of 0.3 feet per day has been used. This value will be verified by pilot testing during project design.

The other variable in recharge capacity is the number of days per year that recharge water is available and the basin is wet. We can compute the estimated annual groundwater recharge by estimating the number of days per year that Section 215 floodwater will be spread into the basin. (See Attachment 7.1D, Table 9b.)

Project F, MD 33 Fairmead Sewer Collection, Treatment and Disposal System Plans, will set the community of Fairmead on a path to construct a WWTP with treated effluent becoming available for use as recycled water for nearby agricultural users who are currently pumping groundwater. This in-lieu irrigation will result in water being left in the groundwater aquifer for beneficial use by others. (See Attachment 7.1F, Table 9b.)

III. Protect Groundwater Quality – The **MD 8 North Fork/ South Fork Sewer System Improvements** will take out of service fields of septic systems known to be leaking and contributing pollution to the local groundwater. The North Fork project will eliminate the discharge of untreated effluent from septic tanks to the groundwater and potential spills from the North Fork Mill House Facility treatment facility. The depth to groundwater is approximately 30 feet. Removal and abandonment of the existing private septic and leach systems will negate potential pollution and contamination of the groundwater. Existing South Fork septic system flows are estimated to be approximately 15,875 gallons per day, assuming an average flow rate of 250 gallons per dwelling unit. The existing South Fork private septic systems will be abandoned and replumbed to connect to the proposed sewer collection system and pumped to the existing MD-8A North Fork Waste Water Treatment to treated. (See Attachment 7.1C, Table 9a.)

The CSA 14 Chuk-Chanse Sewer System Improvements will also reduce sewage leaking into the groundwater by replacing old, leaking VCP with new PVC pipe where raw sewage is leaking into a local drainage swale. CSA14 Chuk-Chanse operates a small facultative-lagoon wastewater treatment system located about one mile west of the community. The WWTP currently has two long-neglected maintenance issues.

The first is severe cracking in a 300-foot section of the original 12-inch vitrified clay pipe (VCP) collector sewer. Because this section is located directly within a local drainage, the cracking results in excess I&I into the collection line, which then has to be pumped into the lagoon. The cracks are also causing groundwater contamination during the dry months, as they allow raw wastewater to exfiltrate from the sewer collector and into the surrounding drainage.

The second issue is flooding of a neighboring orchard during the spring and early summer months, caused by seepage beneath the western levee of the lagoons. Investigation by Madera County in 2005 revealed that the seepage travels laterally to the west into a neighboring nut orchard, on top of an impervious hardpan layer that is about five feet below the ground surface. The water migrates to the surface, leaving standing puddles that bloom with algae in the spring and early summer months. While this seepage has not yet drawn enforcement action from the RWQCB, such discharges onto neighboring properties are not permissible and repair is required.

The Project recommends a two-part repair to address these separate contamination issues:

1. Replacement of the 500 LF of cracked VCP sewer by constructing a parallel 12-inch PVC SDR35 sewer, connected to the original collector line at each end of the PVC using 45-degree connections with a standard 48-inch manhole at each angle point. Since the collector sewer travels through open ground, the parallel construction can be accomplished by simple conventional construction methods and is by far the most cost effective alternative. See Table 9 in Attachment 7.1E.

2. Construction of 300 LF of trench drain along the toe of the west end of the lagoon levee. See Attachment 8.1, Project E for details. The trench drain will allow seepage water to penetrate the hardpan and percolate into the deeper ground layers, eliminating the lateral travel and the puddling in the neighbor's orchard.

   Both of these repairs are simple, cost effective, and beyond the reach of CSA14's very limited capital program budget, which is funded only by the user charges from 31 connections in this DAC. (See CSA 14 Operating Budget, Attachment 4.3E.)

The **MD 33 Fairmead Sewer Collection, Treatment and Disposal System Plans** will also take out of service a field of septic systems known to be leaking and contributing pollution to the local groundwater. The proposed project, once carried through to construction completion, will replace existing private individual septic tanks (many of which are failing and leaking) with a community-wide sewer disposal system to serve the disadvantaged community of Fairmead.

These septic tanks have been noted by Madera County Environmental Health Department in their annual system assessment as having potential to create outside contamination of the District's wells. A copy of the complete assessment may be viewed at the State's website, www.dhs.ca.gov/ps/ddwem/technical/dwp/source_info/source_index.htm.

If the proposed project does not happen, the residents of the disadvantaged community of Fairmead will remain dependent on individual and failing individual septic systems. This creates a potential health hazard for Fairmead's residents.

In addition, these projects are spatially located throughout the Region, appropriately reflecting the collective impact on the underlying groundwater basin and the connectivity between upper and lower watersheds (See Regional Project Map, Attachment 3 page 15). Although proposed projects are located throughout the Region in areas where their impacts are particularly needed, together they will have a synergistic effect which will benefit the entire region. Groundwater recharge may primarily benefit one area but ultimately impacts the entire basin's resources. The Madera Region is one of the few IRWM regions which contains both the valley

and foothills including both water source and water use areas and reflecting the essential connectivity between upper and lower watersheds. The choice of projects for this application reflects an appreciation of the need for projects throughout the Region to address water management problems and challenges.

Documentation of the breadth and magnitude of the Program Preference: The magnitude of the above benefits is documented by

- Parkwood Water Supply and Water Meters
  - Attachment 7.1B
    - Project Physical Benefits
  - Attachment 8.1B
    - Non-Monetized Benefits
    - Annual Project Physical Benefits
    - Annual Costs of Avoided Projects
- North Fork/ South Fork Sewer System Improvements
  - Attachment 7.1C
    - Project Physical Benefits
  - Attachment 8.1C, sections:
    - Non-Monetized Benefits
    - Annual Project Physical Benefits
    - Annual Fiscal Benefits
- Brockman Flood Control Basin
  - Attachment 7.1D
    - Project Physical Benefits
  - Attachment 8.1D
    - Non-Monetized Benefits
    - Annual Costs of Avoided Projects
    - Table 17 – Flood Damage Reduction
- Chuk-Chanse Sewer System Improvements and Water Meters
  - Attachment 7.1E
    - Project Physical Benefits
  - Attachment 8.1E
    - Non-Monetized Benefits
    - Annual Project Physical Benefits
    - Annual Costs of Avoided Projects
- Fairmead Sewer Collection, Treatment and Disposal System Plans
  - Attachment 7.1F
    - Project Physical Benefits
  - Attachment 8.1F
    - Non-Monetized Benefits

2. Integrating Water Management with Land Use Planning – Water management in the Madera region is challenged by related phenomena – the decline of groundwater levels due to overdraft and pressures for development in the very areas where groundwater level declines are the greatest.

The proposed Brockman Flood Control Basin project will provide flood damage reduction benefits to a long-standing community (Madera Ranchos) that is not fully developed, in part because many of the undeveloped parcels are located within the 100-year SFHA. In addition it will provide surface water supplies to help relieve groundwater decline in the seriously-impacted Madera Ranchos area. Currently and in the foreseeable future, this portion of the Madera Region (southeast Madera County) will be the focus for all of the County's development.

The project includes

Documentation of the breadth and magnitude of the Program Preference: The magnitude of the above benefits is documented by

- Brockman Flood Control Basin
    - Attachment 7.1D
        - Project Physical Benefits
    - Attachment 8.1D
        - Non-Monetized Benefits
        - Annual Costs of Avoided Projects
        - Table 17 – Flood Damage Reduction

3. Statewide Priorities – The proposed program address the following Statewide Priorities:

a. Drought Preparedness – The project addresses drought preparedness by:

- Increasing water supply to MD19 Parkwood, to the minimum level required by California Department of Public Health (equivalent to Max Day Demand) will provide a measure of reliability to that DAC by providing a second well source
- Increasing total water supplies by importing surface waters to the Brockman Flood Control Basin. It also helps assure the availability of groundwater by recharging it during wet years with Section 215 water which would otherwise go unused.
- Reducing domestic water demand by installation of residential water meters in compliance with the forthcoming State statute. DACs MD19 Parkwood and CSA 14 Chuk-Chanse will both be implementing this documented water savings measure.

Documentation of the breadth and magnitude of the Program Preference: The magnitude of the above benefits is documented by

- MD19 Parkwood
    - Attachment 7.1B, narrative and documentation
- Brockman Flood Control Basin
    - Attachment 7.1D, narrative and documentation
- CSA14 Chuk-Chanse
    - Attachment 7.1E, narrative and documentation

b. Efficient Use of Water – DACs MD19 Parkwood and CSA 14 Chuk-Chanse will reduce domestic water demand by installation of residential water meters in compliance with the forthcoming State statute. The Brockman Flood Control Basin Project will accept Section 215 Flood Water that would otherwise cause flood damage downstream of the project location or would leave the Region unused.

Documentation of the breadth and magnitude of the Program Preference: The magnitude of the above benefits is documented by

- MD19 Parkwood
    - Attachment 7.1B, narrative and documentation
- Brockman Flood Control Basin
    - Attachment 7.1D, narrative and documentation
- CSA14 Chuk-Chanse
    - Attachment 7.1E, narrative and documentation

c. Expand Environmental Stewardship –

- The Brockman Flood Control Basin project will enhance wildlife habitat by increasing the acreage of native vegetation, expanding the acreage of ponded waters, and increasing shoreline length. Each of these will result in a net increase in habitat for many species, both migratory and resident, including several special status species that have been found in the sloughs.
    - *Western Yellow-billed cuckoo (Coccyzus americanus occidentalis*), a federal candidate species
    - Southwestern willow flycatcher (*Empidonax traillii extimus*) a state and federally endangered species
    - Least Bell's vireo (*Vireo bellii pusillus*), a state and federally endangered species
    - Swainson's hawk (*Buteo swainsonii*), a state threatened species.

Documentation of the breadth and magnitude of the Program Preference: The magnitude of the above benefits is documented by

- Brockman Flood Control Basin Project
    - Attachment 7.1D and documentation
    - Attachment 8.1D and documentation

d. Integrated Flood Management - This Statewide Priority will be met by the Brockman Flood Control Basin project, which will help decrease flooding on the San Joaquin River by diverting and using floodwaters for irrigation.

Documentation of the breadth and magnitude of the Program Preference: The magnitude of the above benefits is documented by

- Brockman Flood Control Basin Project
    - Attachment 7.1D and documentation
    - Attachment 8.1D and documentation

e. Protect Surface and Groundwater Quality - Surface and groundwater quality will be protected as follows:

- The groundwater quality in the North Fork/ South Fork area will be protected by replacement of failing septic tanks, and by recharge of groundwater with treated effluent.
- The Brockman Flood Control Basin project will improve groundwater quality through importing high quality surface water that will mix with the groundwater and improve its overall quality. The project will also help to maintain existing groundwater levels in an area where groundwater quality is known to worsen with depth.
- The groundwater quality in the Chuk-Chanse area will be protected by replacement of a leaking sewer collection pipeline.
- The groundwater quality in the Fairmead area will be protected by replacement of failing septic tanks, and by recharge of groundwater with treated effluent.

Documentation of the breadth and magnitude of the Program Preference: The magnitude of the above benefits is documented by

- MD8 North Fork/ South Fork
    - Attachment 7.1C, narrative and documentation
- Brockman Flood Control Basin
    - Attachment 7.1D, narrative and documentation
- CSA14 Chuk-Chanse

    - Attachment 7.1E, narrative and documentation
- MD 33 Fairmead
    - Attachment 7.1F, narrative and documentation

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